BRIEFING CHART

NASA SBIR/STTR Technologies

Cryogenic Cooling System for Zero-Venting Storage of Supercritical Air Packs

PI: Dr. Michael G. Izenson/Creare Incorporated, Hanover, NH

Proposal No. F3.02-8982

Identification of the Innovation

A mechanical cryocooler to keep supercritical air packs ready to use.

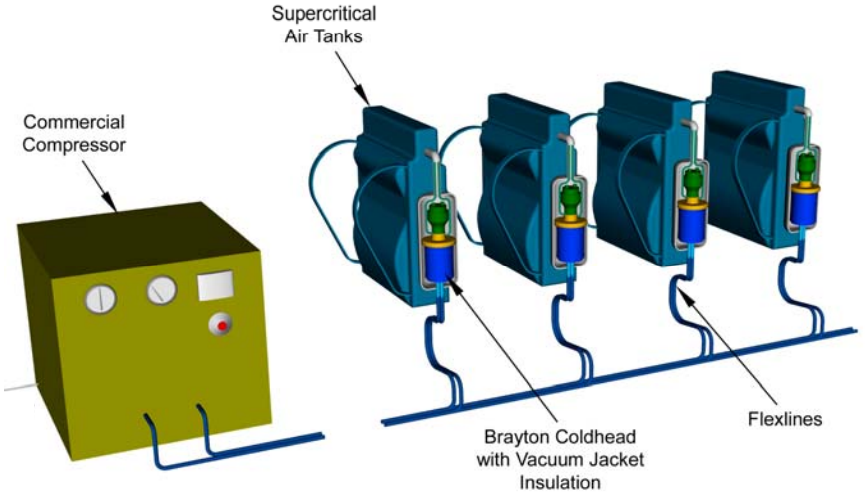
Significance

Launch-pad rescue personnel at NASA KSC would like to replace existing liquid-air packs with supercritical air packs.

The cryogenic cooler enables the supercritical air packs to be stored ready-to-use indefinitely by preventing gas venting.

The cryocooler provides a continuous gas flow to an array of cold heads, providing maximum flexibility for installation and use.

The cooler can also be used to charge empty packs, replacing the existing LN2 system.



Cryogenic Cooler Concept for Supercritical Air Packs

Technical Objectives

- Zero air venting from supercritical air tanks.
- Flexibility for ease of integration and use.
- Rapid disconnection.
- High reliability.
- Dual use as a charging system.
- Suitable for use in space with suitable compressor technology.

Work Plan

Select optimal cooling system (reverse-Brayton vs. JT).
Specify concept for integrating cooler with supercritical air packs.
Design the components in the cooling system.

NASA Applications

Terrestrial: Launch pad rescue operations.
Extraterrestrial bases: High density, zero-venting gas storage.

Non-NASA Applications

Firefighters, rescue workers, first responders, and industrial HAZMAT.

Contact

Dr. Michael G. Izenson, Principal Engineer, Creare Inc.
603-643-3800 or mgi@creare.com